

# THE TECH

VOL. XXX. NO. 15

BOSTON, MASS., FRIDAY, OCTOBER 21, 1910

PRICE TWO CENTS

## ROCKEFELLER INSTITUTE SURGICAL DISCOVERIES

### Drs. Carrell and Montrose Succeed In Cultivating Live Tissues

New surgical discoveries of great interest and with great future possibilities have just been announced by Dr. Carrell and Dr. Montrose of the Rockefeller Institute of Medical Research. It seems that these two men have succeeded in cultivating adult tissues and cells of various organs outside of the body. The scientists who have made this start feel that the perfection of it will be of great help in opening up hitherto unexplored fields of human pathology. The first account of these discoveries appeared in the American Medical Journal, from which the following is an extract:

"Adult tissues and organs of mammals can be cultivated outside of the animal body. This can be used for the study of many important problems. For instance, it may render possible the cultivation of certain micro-organisms in conjunction with living tissue cells or alone in plastic media. Then it will be of great value in the study of the problem of cancer. We can assume that the perfection of this method of cultivating adult tissue outside of the body will be helpful in the exploration of hitherto unknown fields of human pathology."

The largest steamer that has ever been launched was set afloat yesterday at the shipyards of the White Star Line in Belfast. The gigantic measurements of this ship are astonishing. Some idea of its enormous length may be gained when it is said that it would over-top the Metropolitan Building in New York, and that it is four times as long as the Bunker Hill monument is high. The rudder of this boat alone weighs 100 tons. The "Olympic," for such is its name, will carry in all 2500 passengers and a crew of 860. It is provided with some parlors, tennis courts, Turkish baths, swimming pools, elevators and all other conceivable conveniences.

### HOCKEY TEAM.

Meeting of last year's men Friday noon at 1.40 in Union side room to elect captain.

### CALENDAR.

#### FRIDAY.

1.00—1913 Mass Meeting, Huntington Hall.

1.00—Theatre Tickets on Sale—Rogers.

1.30—Electrical Engineering Society Leaves for Lynn—North Station.

1.40—Hockey Team Meets in Union Side Room.

4.00—Banjo Club Trials—Union.

4.00—Crew Practice.

4.00—1913 Football Practice—Oval.

4.00—1913 Relay Practice—Field.

4.00—1913 Tug-of-War Practice—Gym.

4.00—1914 Football Practice—Field.

4.00—1914 Relay Practice—Field.

4.00—1914 Tug-of-War Practice—Gym.

4.15—Orchestra Rehearsal—Union.

5.00—Aero Club Meeting—Union.

#### SATURDAY.

1.00—Theatre Tickets on Sale—Rogers.

2.15—Fall Handicap Track Meet—Field.

8.00—Architectural Club Smoker—42 Pierce.

## TRANSIT DESCRIBED BY MR. R. S. WARDELL

### Keuffel and Esser Representative Explains Instruments to E. E. Society

At a meeting of the Civil Engineering Society yesterday, at 4.15, Mr. R. L. Wardell, of the Keuffel & Esser Company, spoke to seventy-five members on the manufacture of Engineering Instruments.

The transit was the particular instrument upon which Mr. Wardell dwelt, this, as he said, being the most useful instrument in modern engineering work. The first machine used in surveying work was that used in the laying out of the streets in Alexandria, Egypt, and consisted of a wooden cross with uprights. From that crude affair has developed the exact transit of today.

The metal first used for these instruments was brass, but that proved to be too soft; so Bell metal, an alloy of copper and tin in the ratio of 4 to 1, has largely supplanted it. This metal is as hard as ordinary steel and has a uniform density, and is used wherever there is stress, strain, or friction.

The speaker then proceeded to take a transit apart, explaining as he went along how the different parts were made and put together. He first removed the small cylindrical cup which carries the plumb bob support and which also contains a spring which passes upward and reduces the friction between the upper and lower parts of the instrument. The transit was then divided into three parts—the upper structure containing the inner circle, standards, vertical circle and compass box; the graduated circle, and the half ball joint which is responsible for the shifting center mechanism.

The central upright axis is protected by a sleeve, and the levelling screws are so placed that a strain cannot be directly transmitted to this axis. This axis is most carefully ground by machine and hand so as to get a perfect fit.

The upper plate is ribbed so as to give the whole a greater rigidity. The standards are supported on one straight and one twisted support. In this way a better bearing is obtained and greater rigidity results.

The telescope slide is supported on two bronze rings in the outer tube, and the objective is formed by a pinion in a ring.

Good spider web for the cross hairs is rather difficult to obtain. This company offers five cents to anyone who brings to its office a certain type of spider with a yellow cross on its back during specified months, and these spiders spin their webs on rectangular frames. Some of the workers become attached to their spiders and will even follow them up the wall by means of a ladder to get the web. The web is mounted on the diaphragm with a thin shellac. Some makers use platinum wire, but it has been shown that spider web has a greater tensile strength than platinum, is easier to handle, and can be secured more readily in the field.

A nine-foot circle is used in graduating the smaller ones used on transits. The graduations are made on solid silver and a maximum error of three seconds is allowed on an entire circle.

The tangent screws are made of German silver, and the clamp screws bear upon secondary sleeves.

(Continued on Page 2.)

## GLIDER FLIES FOR VESPER COUNTRY ALUMNI

### Aero Club Gives Successful Trial Flight at Speed of 22 Miles

The M. I. T. Aero Club demonstrated the use of the glider at the Vesper Country Club before the Technology alumni of the Merrimack Valley Tuesday afternoon. On account of the lack of wind it was necessary to tow the glider with an automobile. A speed of 22 or 23 miles an hour was obtained, and Lehmann 1912, made a very pretty flight. At the end of the course the automobile had to be stopped, leaving the glider free in the air. An eddy current tipped the machine so that one corner struck in landing, and two struts were broken. As it was only a few minutes until dinner, the flights were stopped for the afternoon.

The members of the club were entertained very hospitably by the alumni, who seemed to be very much interested in aeronautics.

At the dinner Dr. Rotch made a very interesting speech. Of particular interest was his description of the prevailing winds at different altitudes. He said that if Mr. Wellman's balloon had been capable of sustaining itself for three or four days he might have ascended to a height of two or three miles and struck a steady wind from west to east. This wind has a velocity of from 40 to 80 miles per hour, and would have landed Mr. Wellman in Europe from three to four days.

Mr. Fales also made a speech describing the past work of the club and telling some of the things planned for the future. Mr. Fales said, in part, that a safe aeroplane should be small, swift and efficient. These three go together, and an increase in one leads to an increase in the others. Since the efficiency of an aeroplane surface is very low indeed compared to that of a bird's wing, it seems possible to increase the efficiency by changes in the shape and nature of the planes. Mr. Fales said that work would be done by the club in testing surfaces, also that the Institute owns a propeller-testing device which will be used to test propellers already built by the club members.

The glider will be returned to Boston next week and flights will probably be resumed in Cambridge.

### E. E. SOCIETY EXCURSION.

About eighty men have already signed up for the first excursion of the Electrical Engineering Society to the plants of the General Electric Electric Company at Lynn Saturday afternoon. A special car has been secured and will leave the North Station at 1.30.

A number of guides will take charge of the party who will inspect both the River plant and the plant at West Lynn.

The number of men going on this trip is large for a first excursion, but it is hoped that even more will attend the coming ones, and that there will be more of the Junior class who turn out.

### NOTICE.

Aero Club—Meeting at 5.00 P. M., today, in the Union. All members and those wishing to join should be present.

## PROF. RICHARDS TELLS OF MEXICAN CUSTOMS

### Describes to Mining Society Their Domestic Life and Work

The Mining Engineering Society was treated to a birdseye view of Old Mexico last night, led by Prof. Richards. He gave an outline of his experiences while a member of a visiting party of the A. I. M. E., which traveled through the heart of this interesting country in the year 1900. He touched on the different phases of domestic life and mining, concluding with a few sidelights on Mexican history. The entire talk was illustrated by lantern slides prepared from photographs taken by Prof. Richards during the trip.

The party entered the country from the north at El Paso and proceeded south beyond Mexico City, stopping at various points along the route and then followed the eastern coast back north to the states.

One of the first slides was a gruesome view of a vault along the sides of which were propped dried mummies of departed peons whose relatives had rented niches for their post mortem resting places. Since the photograph was taken the Mexican authorities have draped the nude figures in night-gowns to protect them from souvenir hunters, who formerly used to add a finger or toe to their collections to the serious mutilation of the mummies. The end of this vault was stacked with the bones of delinquent rent payers, which had been ruthlessly removed and broken.

Next views were shown of the open-air laundries and the different forms of cacti which abound on the great plateau. The process of making pulque, the national drink, from the sap of the century plant was next described. An incision is first made in the heart of the plant and the juice which collects here is withdrawn daily by means of a pipette and later fermented. This fiery drink appears on festival days colored with the national colors of green, red and orange.

The milk and water carriers of Mexico City attracted considerable notice. Most of the carrying is done by burros or ox-carts with home-made wheels which can be heard for a distance of two miles. Many of these carts have descended from generation to generation, and in the vicissitudes of time have been patched up in a rough and ready fashion which appeared most entrancing when viewed on the screen.

All along the route the party were welcomed royally by the inhabitants, and in one city they were treated to a bull fight—the highest honor possible in this country. The fight was held in a large amphitheatre which was arranged so that one side faces the sun while the other is in the shade. Naturally the seats on the shady side are most desirable and bring a higher price, but the entire seating capacity was filled in the picture shown, appearing much like the crowd at a big league baseball game.

In the rural districts the houses are generally crude structures of stone or adobe with thatched roofs, but other architecture in the cities is more pretentious. Many of the city residences enclose courtyards and gardens.

The cities generally have a patio or park in their centres with a bandstand. Here, on Sundays and festival days may be seen two processions passing in opposite directions—one of boys and the other of girls. When

(Continued on Page 2.)

**THE TECH**

Published daily, except Sunday, during the college year by students at the Massachusetts Institute of Technology.

Entered as second-class matter, Sept. 29, 1910, at the post office at Boston, Mass., under the Act of Congress of March 3, 1879.

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Office, 42 Trinity Place.  
Telephone, Back Bay 2184.

All communications should be addressed to the proper departments.

Subscriptions \$2.00 per year in advance. Single copies 2 cents.

Subscriptions within the Boston Postal District and outside of the United States must be accompanied by postage at the rate of one cent a copy.

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FRIDAY, OCTOBER 21, 1910.

By this time you will have discovered how bothersome the two-cent cash sale is for you as well as us. Why not help yourselves as well as us by subscribing to the coupon idea. Every coupon is good for two cents for The Tech. There are 14 strips of 12 each, or a total of 168.

Three dollars and thirty-six cents for TWO DOLLARS.

For sale by boys and at the Cage NOW.

**REUNION OF 1910 AT MERIDEN.**

There will be a reunion of those members of the class of 1910 living in the vicinity of Meriden tomorrow. Those present will include John Ahlers, C. H. Cummings, R. M. Gillis and G. S. Mulchreest.

**DEATH OF 1878 SECRETARY.**

Mr. Linwood O. Towne, 1878, Course III, died Wednesday afternoon in Haverhill, Mass. Death was due to heart failure, an attack of which he had last spring. He had been ill for the past three days and was ascending the stairs to his room about noon when he collapsed and died in an ambulance which had been summoned to take him to the hospital.

Mr. Towne was prominent in Technology affairs, being a member of the Alumni Committee on Student Welfare and secretary of his class. He had been an instructor in the University of Pennsylvania and for the past nineteen years had been instructor in chemistry and submaster of the Haverhill High School.

**"ENGINEERING INSTRUMENTS."**

By Mr. R. S. Wardell, Representative of Keuffel & Esser, Explains Their Construction.

(Continued from Page 1.)

The V-shaped standard mounted directly on the central axis is rapidly taking the place of the older style of instrument.

Mr. Wardell had with him various types of modern instruments, such as a new type of dumpy level, a three level-screw instrument on a shifting center, and a V-shaped standard transit.

After the lecture the members took the opportunity to inspect some of the latest types of transit, of which there were a large number on exhibition.

(Continued from Page 1.)  
a boy sees a girl who attracts him he signifies it by throwing a comfit or some confetti at her. This is the first stage in love-making. The second step is for the young man to gaze at the lady of his choice from the other side of the street while she sits in her barred window. Neither speaks until the girl's relatives invite the young man into the house. The young lady then writes a love-letter, if she has the education, or goes to a public letter writer. From this stage the courting progresses rapidly to its consummation in the marriage feast.

After his interesting treatment of the social and domestic life in Mexico, Prof. Richards touched on the mining methods. One of the old workings was a large octagonal shaft lined with stone and cemented. There were evidences that hoists had stood on each of the eight sides worked by a horse and windlass. After reaching a depth of 800 feet the work had been abandoned, probably because of difficulty of getting strong enough rope. Some mines of this type have been re-opened. A few pictures were shown of half-stripped miners drilling in the mines, and one showed the primitive "chicken ladder," consisting of notches in a plank.

After the preliminary breaking the silver sulphide ore goes to a primitive Chilian mill consisting of a single wheel revolved by a burro. Men follow the wheel and shovel the ore into a screen arranged around the side. This mill crushes to about the size of grains of corn. The ore is then reduced till it passes through a six-mesh size by dragging a heavy stone over it by means of another burro.

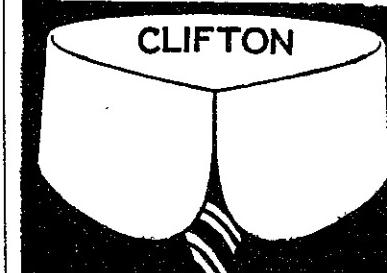
The ore is then ready for the patio extraction process. It is spread out in the open air, covered with water, and salt and copper sulphate are then added. This is mixed by the hoofs of animals driven all over it and by the action of the air and chemicals. Copper chloride is formed which converts the silver sulphide into chloride. At this point quicksilver is added which amalgamates with the silver. This amalgam is separated, and the silver recovered together with most of the mercury. This treading of the ore is very hard on the animals and they soon get poisoned by the copper salts, but it is cheap and effective.

Finally Prof. Richards touched on the water systems, both ancient and modern, contrasting the massive aqueducts with the later pipe lines. A picture was shown of the great drainage canal of Mexico City, which protects the city from flood. This is necessitated by the location of the city in an old lake bottom.

Before Prof. Richards' address the society voted unanimously to accept the offer of affiliation of the American Institute of Mining Engineers. The names of proposed new members were also read and the matter of their admission will come up at the next meeting to be held in about two weeks.

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**TESTING CONCRETE BEAMS.**

At 2 P. M. Wednesday, October 19th, about thirty members of the Boston Society of Civil Engineers met in the Laboratory of Applied Mechanics to witness the testing of a reinforced concrete beam fourteen days old, and a plain concrete column eleven days old. Among those present were some of the best known engineers of Boston, who took advantage of the opportunity offered to see how tests are made in the Laboratory.

The tests were carried out by the Laboratory force, assisted enthusiastically by the visiting engineers, who hunted for cracks in the specimens with great zeal. The beam tested was 8 inches by 13 inches, rectangular cross section, and 14 feet long, being reinforced with 8½-inch square steel rods and suitable stirrups. The load was applied at the third points with a space of 13 feet.

The beam was tested in the 100,000 pound beam machine, load being applied in 3000 pound increments, readings for deflection being taken at each interval. A few cracks on the under side of the beam were noted at about 14,000 pound load, and their development was followed up to the maximum load of 22,200 pounds, where the beam broke by compression of concrete at the upper surface.

The plain column, 8 feet long and 7 inches by 7 inches cross section, was tested in the Emery machine, load being applied in 3000 pound increments up to 36,000 pounds, readings for compression being taken at each interval. From those readings the modulus of elasticity will be computed. The load was then run on without halt up to the maximum of 138,300 pounds, at which pressure the column broke suddenly in the middle.

Both specimens were furnished by the Aberthaw Construction Company of Boston.

**MUSICAL CLUB TRYOUTS.**

The musical clubs' season has started again and all signs point to a most flourishing year. The Glee Club, as usual, had the most candidates, about fifty fellows in all turning out for the first trials. The names of twenty-two new men who were to report for the first rehearsal, which was held yesterday, were posted, and almost every man was present. Three new men

were chosen for first, and six for second tenors, and ten for first and three for second basses. In addition to the new ones many of last year's members are expected back. The Mandolin Club selected twelve new men to report to the first rehearsal yesterday, and a fairly large membership is expected this year. The first orchestra rehearsal will be held today at 4 o'clock in the Union, and a large number will probably attend. The orchestra needs more violins and cellos, and any men playing these are requested to come out. The Banjo Club trials take place today at the Union at 4 o'clock, and a large number of Freshmen are expected to try for membership. All new men who have not yet reported or who intend to report, should do so at the next meeting of the club if they intend to try for membership.

**ARCHITECTS' FIRST MEETING.**

**Mr. Ernest Flagg of New York to Speak on Public Buildings.**

Tomorrow evening, at 8 o'clock, at the Pierce Building, the Architectural Society will hold their first "smoker" of this year. Mr. Ernest Flagg, of New York City, one of the most eminent architects of the country, will speak on "Public Buildings." Mr. Flagg, who is a graduate of the Ecole des Beaux Arts of Paris, is famous as the designer of the Brooklyn Bridge, the Singer Building and the Soldiers' and Sailors' monument of New York. He also designed the buildings of the United States Naval Academy at Annapolis, and has been considered the most eminent authority on architecture that this nation has ever produced. The talk will be especially interesting and instructive to all men taking the course in architecture, and it is hoped that every member of the society will be present. A very short business meeting will be held before the talk, and the second year men who are taking Course IV will be elected to membership.

At the next regular meeting, which will probably be held the first week of next month, Mr. F. A. Burton, the son of Dean Burton, will speak on his summer trip to Europe. Later on in the year the society expects that talks will be given by Mr. J. Randolph Coolidge, Jr., of the firm of Coolidge & Carlson, of Boston; Mr. R. A. Cram, noted in gothic and church architecture, and by Mr. F. A. Olmsted.

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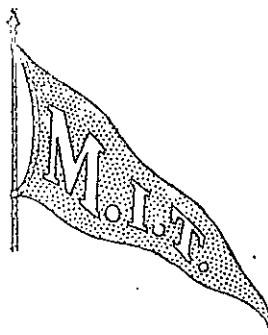
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**PROBLEMS IN SECOND YEAR  
PHYSICS.**Sections X<sub>1</sub> and X<sub>2</sub>.

Due Monday, October 24th, 1910.

Nos. 88a, 90, 92, 99 and 100 in last year's problem sheet.

1. If a train running 60 miles an hour is brought to rest in 20 seconds by the application of the brakes, what is the acceleration? How far does it go after putting on the brakes?

2. The Eiffel Tower is 340 meters high. How many seconds will elapse before an arrow, shot upward from the tower with a velocity of 60 meters per second, reaches the earth?

3. How far will a body fall in vacuo during the time in which its velocity increases from 88.55 feet per second to 136.85 feet per second? How long is this interval?

4. A stone is dropped over the edge of a cliff and 4.16 seconds thereafter the sound of its striking is heard. Find the height of the cliff if the velocity of sound is 330 meters per second.

5. An electric car starts from rest and in 8 seconds is traveling at a rate of 25 miles an hour; this speed is maintained constantly until within 300 feet of the next stop. Find the acceleration (a) at starting, (b) at stopping, and also the total time between stations if the distance is 1 mile. How much of the distance is traversed at uniform speed?

MINING ENGINEERING SOCIETY MEETING Thursday, October 20, in the Union at 7.30 P. M. Professor Richards will give a talk on Mexico, and important business will come up. All Course II men are urged to be present.

11-12

BASKETBALL.—Owing to the non-return of A. T. Dennis, the position of basketball manager is now open. Any men wishing to try for the position will please communicate with T. B. Parker 1911, Captain.

**ART MUSEUM.**

Free tickets of admission to the Museum of Arts for the year 1910-1911 will be issued to students upon application at the ticket office at the entrance to the Museum.

H. S. STORY,  
Curator.

British Empire.

All new students from any part of the British Empire are requested to leave their names at the Cage for

THE CHAIRMAN,

British Empire Association.

**Theatre Tickets.**

Seats for Tech Night at the theatre will be on sale in Rogers corridor from today until Friday, October 28, from 1.20 to 2 o'clock. Those not obtaining seats before Friday, October 28, from the theatre committee, will be compelled to go to the box office for them. No seats reserved without payment.

**FOREIGN STUDENTS.**

All foreign students at the Institute who desire to become members of the Cosmopolitan Club should leave their names at the Cage for Isaac Hausman, secretary, at once. Americans desiring to join should do likewise, but election to membership is not guaranteed.

1914.

All Freshmen who have failed to meet me at their appointments for physical examinations must call and arrange new dates between now and 1 P. M. Saturday, October 22, 1910. All examinations, including those of upper classmen, must be finished by October 28, 1910.

F. KANALY.

Uniforms will be issued to the members of the Battalion at South Armory on Wednesday, the 19th. Those drawing Blouse, Trousers and Cap should have \$14.00 for payment; Blouse and Trousers, \$12.60; Blouse, Trousers, Cap and Shoulder Straps, \$17.00.

11-12 CAPT. BOOKMILLER.

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